

Abstract**Flow-through shear analyser for biologically active molecules in liquid layers on surfaces**

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The adsorption rate of proteins from solutions on surfaces in the region of interface layers is often so large that a depletion of the protein in the interface layer results. Due to this, the total reaction becomes transport-dependent, sensitively disrupting the determination of the rate constants. In known TIRF-analysis chambers or bio-sensor systems with a liquid interface layer of  $\sim 10 \mu\text{m}$  thickness and mass transport coefficients of  $10^{-6} - 10^{-5} \text{ m/s}$  it has up to now been impossible to alleviate this transport limitation.

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With the help of a TIRF-flow-through shear analyser in which a certain volume unit of an immiscible fluid, for example an air bubble, is fed into the buffer flow, an ultra-thin liquid layer arises on the surface with a thickness of 100-200 nm, wherein interface surfaces below 10 nm thickness are technically possible.

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The new TIRF-flow-through shear analyser therefore allows the generation of ultra-thin liquid layers while increasing the mass transport coefficients for proteins by 50-100-fold so that the sorption rate constants can be determined without transport limitation.

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